What is claimed is:

1. A fiber Bragg grating sensor system comprising:

a wavelength tunable laser including a wavelength tunable filter for outputting a tunable wavelength light;

a first coupler for receiving the light outputted from the wavelength tunable laser and for splitting the light into two directions;

a reference wavelength generating unit for receiving one of lights split by the first coupler, for generating reference wavelengths to measure real-time wavelengths of the light outputted from the wavelength tunable laser, and for defining one of the reference wavelengths as an absolute reference wavelength;

a fiber Bragg grating array for receiving the other of lights split by the first coupler and for reflecting the lights by each of wavelengths of the grating therein;

a fiber grating wavelength sensing unit for measuring times when each of lights reflected from the fiber Bragg grating array is detected;

a signal processing unit for receiving times of the reference wavelengths generated from the reference wavelength generating unit and times when lights are detected from the fiber grating wavelength sensing unit, for calculating wavelengths in each time period of light outputted from the wavelength tunable laser, and for calculating wavelengths of the lights detected from the fiber grating wavelength sensing unit; and

a laser wavelength control feedback unit for applying AC voltage to the wavelength tunable filter for output wavelength of the wavelength tunable laser to be periodically changed, and for receiving data of the wavelengths in each time period of the wavelength tunable filter from the signal processing unit and for applying DC voltage to the wavelength tunable filter in order that the wavelengths in each time period of the wavelength tunable filter are regularly repeated.

2. The fiber Bragg grating sensor system according to claim 1, wherein the wavelength tunable laser comprises:

a laser diode for providing pumping lights;

a wavelength-division multiplexer for injecting the light outputted from the laser diode to a gain medium;

an erbium-doped optical fiber used as a gain medium; and

a wavelength tunable filter controlled by the AC voltage for periodically scanning or tuning the laser wavelength.

3. The fiber Bragg grating sensor system according to claim 2, wherein the output of the wavelength tunable laser is mode-locked by tuning the magnitude and frequency of the AC voltage applied to the wavelength tunable filter.

4. The fiber Bragg grating sensor system according to claim 1, wherein the reference wavelength generating unit comprises:

a Fabry-Perot filter;

a reference fiber grating; and

a photodetector,

the reference wavelength generating unit characterized in that reflective wavelength of the reference fiber grating is matched with one of wavelengths transmitted through the Fabry-Perot filter thereby corresponding peak is vanished, and the following peak next to the vanished peak is used as an absolute reference wavelength.

5. The fiber Bragg grating sensor system according to claim 4, wherein the reference fiber grating is temperature-stabilization-packaged and linewidth of the reflected wavelength is widely and flatly processed.

6. The fiber Bragg grating sensor system according to claim 4, wherein etalon gap of the Fabry-Perot filter consists of vacuum or air.

7. The fiber Bragg grating system according to claim 4, wherein the Fabry-Perot filter is maintained at a predetermined temperature.

8. The fiber Bragg grating sensor system according to claim 1, wherein the first coupler; a plurality of the fiber Bragg grating arrays; and a plurality of the fiber grating wavelength sensing unit corresponding one by one to the fiber Bragg grating array are optically connected by a multi-channel splitter.

9. The fiber Bragg grating sensor system according to claim 1, wherein a

depolarizer is further installed at an output end of the wavelength tunable laser.

10. The fiber Bragg grating sensor system according to claim 9, wherein the depolarizer comprises two pieces of polarization-maintaining optical fiber having a length ratio of 1:2 and spliced at the angle of about 45° between them.

11. The fiber Bragg grating sensor system according to claim 1, wherein the wavelength tunable laser further comprises a polarization scrambler at output end thereof.

12. The fiber Bragg grating sensor system according to claim 1, wherein the DC voltage is applied in order to constantly maintain time when the absolute reference wavelength is located.